AUD007 Municipal Fiscal Reporting and Determinants of Financial Regularity Audit Outcomes

Ayaya, O & Scott, D.
University of Limpopo &University of South Africa

Abstract

This paper contributes to developing of a composite model to predict audit outcomes and guide interventions seeking to improve financial reporting practices. It analyses the relationship between municipal financial regularity audit outcomes (FRAO) and selected municipal attributes. It examines the National Treasury's (NT) municipal capacity and Municipal Demarcation Board's structure categorisation in predicting municipal FRAO. The study hopes to contribute to operation clean audit tasks targeted at improving municipal attributes clustered within governance, and fiscal efficacy reform readiness.

The paper is based on ongoing doctoral research on developing and testing a composite model predicting municipal FRAO. The paper employs logistic regression framework in analysing the relationship between selected municipal attributes and FRAO. Logistic regression is applied on data published by the Municipal Demarcation Board (municipal structural categorisation), the Auditor General South Africa (AGSA) (FRAO), and the NT (municipal capacity categorisation data).

A review of the summary of municipal audit outcomes in financial years to June 30, 2013 show unsatisfactory municipal financial reporting practices. About 60 percent of municipalities failed to consistently achieve unqualified audit opinion report during a five-year period to June 30, 2013. The interventions improving municipal FRAO should be based on a composite model of municipal-based data.

Key words: composite model, municipal capacity, accountability, audit outcomes

1. Introduction and background

Each year, the AGSA, the supreme audit institution, and the media report news concerning the "deficient financial management" municipalities and, as a consequence, their delicate financial situation (Powell, O'Donovan, Ayele, and Chigwata, 2014). The importance of audited municipal performance is evident in the National Development Plan (NDP) targeting 75 percent of municipalities to obtain unqualified audit reports by no later than 2019(Powell and O'Donovan, 2014:28). Users of public accounting information, especially the citizens, demand access to data that allows evaluating the financial condition and performance of municipalities, as a means to assess the municipalities' financial and non-financial commitments, related to the provision of services (Kennedy and Shaw, 1991; Christiaens, 1999). In this context, reliance is placed on the AGSA's assurance function in enhancing financial governance in established accountability structures.

Audited financial information allows the municipalities to remain accountable and creates transparency, including a financial reputation, facilitating justification of past decisions and informing future policies (Pablos, *et al*, 2002). Municipal finance management performance measurement, which are audited, underpins a performance management framework, in general, and is supported by the Municipal Finance Act (Act No 56 of 2003) (MFMA). In addition, it forms a building block to the back-to-basics programmes formulated by the Department of Cooperative Governance and Traditional Affairs (CoGTA) (CoGTA, 2014:14). The implementation of the MFMA proved challenging for municipalities receiving modified audit opinions[1] from the AGSA (CoGTA, 2014; Sholtz and Lepheana, 2013; Ambe and Magiro, 2008).

The AGSA has documented municipal specific reasons for municipal modified audit outcomes (refer to the Text Box 1 and Table 2). The majority of the municipalities referred to in Table 2 received modified audit reports from the AGSA. Some of the challenges regarding modified audit reports evolve around municipal weak capacity, which informed the NT's 2014 capacity categorisation and the development of minimum competency regulations (Sholtz and Lepheana, 2013).

There have been various ways poor audit outcomes, reflecting bad financial management and reporting practices, have been addressed by the South Africa (SA) government. One of these ways has been through consolidation of weaker municipalities with seemingly stronger ones for improved performance and implementation of "operation clean audit" programme, targeting elimination of modified audit reports among municipalities by 2014 (Powell, *et al*, 2014). Another way has been to undertake interventions in terms of Section 139 of the South African Constitution and carry out municipal recovery measures led by the national and provincial government. This has not yielded the desired outcomes (Powell, *et al,* 2014, CoGTA, 2014) and municipalities have been sorted into performance tracks to facilitate targeted interventions to dysfunctional ones (CoGTA, 2014:6). The issue therefore is how the national government should detect modified audit reports before they become emergencies for intervention in terms of Section 139 of the Constitution.

Text Box 1: Good practice indicators for municipalities to achieve clean audit results
1. A clear trail of supporting documentation;
2. Quality of financial statements and management information;
3. Timeliness of financial statements and management information;
4. Availability of key officials during audits;
5. Development of, and compliance with, risk management and good internal control practices; and
6. Leadership, supervision and monitoring.

Adapted from: Auditor General South Africa. 2014. <u>Consolidated report of the Auditor-General on the audit outcomes of local government for the financial year 2013-14</u> , Pretoria: The Auditor General South Africa

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[1] In terms of the International Standard on Auditing No 705, Modified audit opinion includes qualified, adverse and disclaimer audit opinions.

2.   Problem statement

As the implementation of the MFMA evolves, the AGSA's reports and the Department of Cooperative Governance and Traditional Affairs' (CoGTA) back-to-basics programme associates a deteriorating financial management picture to municipal specific findings that are broadly categorised in the AGSA's list of good practice indicators for municipalities to obtain unqualified audit outcomes (see T*ext Box 1*). The solution to these problems seem to be context specific and consume resources as demonstrated in the differentiated approached advanced by CoGTA in its back-to-basics programme (CoGTA, 2014:8). As a result, the Minister responsible for local government launched a conceptual model recognising differences among municipalities at their performance and capability (Powell and O'Donovan, 2014:5).

A back and forth intervention process seem to be in place. The principles behind the launched conceptual model, categorising municipalities in three performance tracks (top, medium and low), do not seem to differ from the 2004 NT-led municipal capacity survey that categorised municipalities into low, medium and high capacities. The 2004 NT-led municipal capacity survey and subsequent capacity categorisation recognised the importance of municipal capacity in improved financial management and service delivery. Table 1 shows how local, district and metropolitan municipalities were categorised into low, medium and high capacities. The subsequent audit outcomes (Table 2) could have been used to refine the capacity categorisation to support targeted intervention.

Table 2 shows indicative audit outcomes consistently achieved during a five-year period to June 30, 2013 and facilitates focus from annual FRAO to a 'track record of FRAO'. From Table 2, 115 municipalities (41.4 percent) achieve unqualified audit (with or without emphasis of matter) in at least three years during the five-year period. About 60 percent of municipalities received at least three modified audit opinion reports, reflecting unsatisfactory municipal financial performance, over the five-year period (2008-2013).

Table 1: Summary municipal capacity categorisations

		Municipal Categories			
		Local	District	Metropolitan	Total
Capacity	Low	112(88%)	15(12%)	0	127(45%)
	Medium	85(79%)	22(21%)	0	107(38%)
	High	36(72%)	8(16%)	6(12%)	50(17%)
		233(87%)	45(16%)	6(2%)	284²(100%

Source: Compiled from the February 2004 survey results published in the South Africa Government Gazzette Notice No. 26511

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² The number of municipalities has since changed to 278 as weaker municipalities were consolidated to create well performing municipal structure.

The development of a composite model would be useful to guiding differentiated interventions designed to lead municipalities to achieve municipal audit objectives in the NDP and later refine performance tracks in the back-to-basics programme (CoGTA, 2014). The areas targeted for intervention under the back-to-basics programmes included broad aspects of accelerating service delivery, enhancing good governance, promoting sound financial management, fighting corruption, and facilitating sustainable infrastructure development.

Table 2: Summarised consistently achieved audit outcomes (2008-2013)

		Municipal Category							
		Metropolitan		District		Local		Total	
Audit	3:Unqualified	5	62.5%	28	63.6%	82	36.3%	115	41.4%
	2:Qualified	2	25.0%	7	15.9%	59	26.1%	68	24.5%
	1:Other as modified[3]	1	12.5%	9	20.5%	85	37.6%	95	34.2%
		8	100%	44	100%	226	100%	278	100%

Source: Derived from analysis of AGSA (2013). Consolidated General Report on Local Government Audit Outcomes, Pretoria

3. Research questions

The study endeavours to get answers to the following questions:

    i.   With these results in Table 2 in mind, a question worth asking is: what is the composite model for explaining and predicting consistent record of audit outcomes?

    ii.   What is the predictive value of the 2014 NT municipal capacity categorisation survey results that can guide municipalities achieve improved FRAO?

    iii.   To what extent does the municipal categorisation under the Local Government: Municipal Structures Act (Act No 117 of 1998) impact on FRAO?

4. Justification and significance of the study

Financial regularity audit is a process of validation of financial measurements presented in the annual financial statements (Kuenkaikaew and Vasarhelyi, 2013:13). The resulting FRAO are therefore based on annual financial statements prepared in accordance with approved reporting standards and Sections 121 and 128 of the MFMA. The audit reports and audit action plans seeking to improve weaknesses identified by the AGSA are components of the annual report. From this, it is clear that accounting officers prepare audit action plans in a retroactive basis and without reliance on a systematic model. The adoption of improved financial management, reporting, and monitoring of implementation of audit action plans consume resources (CoGTA, 2014).

Previous studies (Dopuch, Holthausen, Robert and Leftwich, 1987; Green, 1995, Ireland, 2003; Caramanis and Spathis, 2006) model auditors' qualifications among private sector

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[3] Included here are adverse, disclaimed, and unissued audit reports

firms as premised on going concern imperatives. In addition to their private sector orientation, previous studies referenced here use relatively small samples of non-public sector firms. The current study is based on municipalities and going concern uncertainties are important to the extent of their negative impact on public service delivery. In addition, these studies have used market-based and firm specific financial variables.

This study adds a dimension to the prediction of audit outcomes by consideration non-financial variables and data that is specific to the SA environment. For instance, it has been established that contend that large municipalities produce better accounting information (and by extension better audit outcomes) than municipalities in general Falkman and Tagesson (2008). Christiaens (1999) studied determinants of adopting accrual-based financial reporting in municipalities and concluded that municipal accounting reforms among Flemish municipalities was context specific and failed to taken into account the supremacy of budgetary accounting, municipal size, availability of consultants and previous municipality experience in managing reforms. The municipal structure and reporting requirements have been used to model municipal information timeliness and were found to be significant (Dwyer and Wilson, 1989:46-52). However, it is not clear whether these factors play a significant role in the prediction of audit outcomes.

No study has been done specifically with regards to predicting municipal audit outcomes as it has been the case with private sector firms' audit outcomes. However, municipal reporting timeliness has been considered in a number of studies (Payne and Jensen, 2002, Johnson, 1996; Johnson, 1998:378; Knechel and Payne, 2001; and McClelland and Giroux, 2000) have shown that the audit reporting delays are impacted by municipal audit and audit-firm characteristics although the effects of audit characteristics are largely determined by municipal structure and reporting requirements. Ngoepe and Ngulube (2014) have established that record management practices significantly influence audit outcomes, while Powell, *et al,* 2014 have argued that a municipal audit consistency barometer, developed on the basis of a history of audit outcomes, is important in guiding national and provincial government intervention to improve municipal financial management.

There are gaps in existing research that make the present study useful to auditors, national government, and researchers or financial analysts. The findings and recommendations in the reviewed studies do not lead to a model predicting modified audit reports. The factors analysed by studies done outside the South African environment are not entirely relevant to resolving a history of the AGSA's modified audit reports to municipalities. Timely presentation of the municipal annual report by SA municipalities are determined with reference to regulated dates (see sections 72, 121, 126, 128 and 129 of the MFMA). In addition, financial reporting requirements are stipulated in the NT-issued templates and guidelines and allow audit to proceed on a retroactive basis. Failure to submit annual financial statements for retroactive audit may invite s139 of the Constitution intervention by provincial and national governments in the management of a municipality. The development of a model on the basis of retroactive audit reports can explored for use to predict municipal FRAO and make targeted intervention a reality.

5. Objectives of the study and scope

The purpose of the study is to develop a composite logit model to predict FRAO by discerning determinants of municipal FRAO as highlighted in the AGSA assurance reports. The logit model is developed with dependent variable indicating whether the municipality received a modified audit report or not; and the explanatory variables representing mostly public available information on municipalities as defined in Table 4. The study endeavours to answers research questions posed in the section 3 of this paper.

This study improves the understanding of annual reporting and audit as accountability instruments in municipalities and will have policy implications on the targeting of interventions to improve FRAO and later audit of performance information (AOPI). Knowing factors contributing to audit outcomes will help provincial and nation governments plan and implement s139 of the Constitution intervention as informed by consistently achieved FRAO. The AOPI and value for money audit outcomes are not used in this study. The AOPI was introduced in municipalities after 2009 and did not involve expression of audit opinion in its pilot phase. FRAO has been shown to contribute to adoption of recognised financial reporting standards (Christiaens, 1999; Tagesson and Erikson, 2011), a key aspect of MFMA reform.

Table 3: Municipal Capacity Categorisation Survey Attributes

Survey Aspect	Attribute
Governance arrangements	Existence of a budget and treasury directorate (office)
	Number of employees dedicated to the financial function
	Existence of approved delegation policy
	Prevalent vacancies in senior management position
	Number of years of experience in municipal governance issues commanded by existing senior managers
Financial and complexity status	Existence of multi-year budgeting and planning
	Frequency of reporting (oversight) to by management to the council
	Existence of municipal-controlled entities
	External audit lag
	External audit outcome type
Municipal Finance Reform implementation readiness	Existence of MFMA implementation leadership
	Adequacy of project management experience among senior managers
	Existence of MFMA implementation plan
	Dedication of resources to MFMA implementation

Source: Compiled from the survey instrument used in February 2004.

6. Municipal accountability, accounting and audit

There are many dimensions (internal, external, performance information, forensic) of audit (Wasche and Sciortino, 2007). In this study we consider financial regularity audit (Ahlenius, 2000). Audit of municipal accounting information systems require that financial statements

include information on issues such as the budgetary execution level, liquidity and solvency, indebtedness level, cost of the services and goals achieved (Patton, 1992).

Municipal accountability premised on the municipal residents' "right to know" and practiced in public participation in decision making (CoGTA, 2014). Municipal financial reporting and associated audit assurance are significant in the accomplishment of the accountability duty in a democratic society (ASB, 2012). Rightly so, they form a building block to the back-to-basics programme (CoGTA, 2014). Gong (2009:S16) considers audit as "*a part of the accountability architecture (*it does not generate accountability*) as it contributes to the financial health of a government and the effective management of public money.*" The purpose of financial reporting should be understood in the context of different instruments of accountability (Ryan, *et al,* 2002; Miah, 1991). Financial accountability can be achieved through reporting as required in terms of the section 121(3) of MFMA.

On a reduced scope, financial accountability links municipal managers to municipal residents, being related to the use of municipal resources. In this manner, financial accountability comprises of the duty to maintain honesty, comply with legal prescripts (accountability for legality), and maintain an efficient and effective administration (process and performance accountability) (Pablos*, et al,* 2002). It is for this reason that Schelker and Eichenberger (2008) argue, emphasising the role of audit outcomes in accountability, that auditors with an extended mandate improve transparency and provide essential information on the impact of policy proposals on common pool resources. In the case of SA, the mandate extends beyond financial regularity to AOPI (AGSA, 2014).

The contribution of FRAO to municipal accountability can be analysed on the basis of the agency theory. Municipal residents (the principal) puts reliance on audited financial statements to monitor councillors and municipal managers. The existing legislation on local government referred to earlier recognizes the agency theory in the design of the municipal financial governance and accountability structures (CoGTA, 2014; AGSA, 2014).

The need for improved accountability and financial governance required an assessment of municipal capacity along the lines suggested at the recently concluded Presidential Summit on Local Government (CoGTA, 2014). The 2004 NT-led municipal capacity survey provided a basis for determining the timing of MFMA reform implementation in municipalities. The survey considered aspects in Table 3. A number of attributes were considered in arriving at the capacity category (index) of a municipality. A review of the survey instrument show, among others, the audit outcomes during three financial years preceding 2003/2004 contributed to the capacity categorise of 284 municipalities then. Powell, *et al* (2014) have underscored, without providing a tested model but relying on past trend analysis, the contribution of audit consistency barometer to assessing the municipal capacity to achieve municipal audit objectives in the NDP. The audit consistency barometer does not uncover factors underpinning such trend-based metric.

7. Data and methods

Municipal financial performance measurement and associated assurance in SA public administration can be more strategic, efficient and effective by ascertaining which key causal conditions shape its adoption of improved practices. The study is informed by a review of the legislative context of municipal financial management reforms, policy documents, and literature on performance measurement in the public sector. It also focuses on the review of quantitative data on municipal attributes. The paper employs logistic regression framework in analysing the impact of selected municipal attributes on FRAO. Logistic regression is applied on data published by the Municipal Demarcation Board (on municipal structures), AGSA (FRAO as the study criterion variable), and the NT (municipal capacity categorisation data). The two government agencies responsible for determining municipal structures and capacity categorisation consider information from research surveys, stakeholder interviews and other sources. The researcher envisaged, a *priori*, that the outcome of the process activities undertaken by government agencies reflect factors that matter most to municipal fiscal efficacy.

In view of the research questions and associated research objectives, a positivist realism research paradigm (RP) (Guba and Lincoln, 1994: 105) appeared appropriate although the research topic involves an investigation into a legislatively-controlled reporting and assurance system that is open and evolving (Healy and Perry, 2000: 121). As demonstrated by regular interventions, such systems do not to achieve equilibrium in a manner akin to phenomena in natural sciences (Sayer, 2000). Therefore, by applying a positivist realist paradigm we assume that knowledge is statistically generalised to population through statistical analysis of observations about accessible data. The positivist realism paradigm requires that the researcher explores what can be observed and what lies behind what is observed (Chalmers, 1999: 226) and generalise study findings that are not intertwined in theoretical propositions. A number of municipalities have shown unsatisfactory FRAO after attempts were made to prepare them for modernised financial management and reporting practices (Table 2, CoGTA, 2014:6).

The data on FRAO during the period 2004-2013 were collected from the audit reports of the AGSA on 234 municipalities (excluding district municipalities). The FRAO was used the criterion variable because access to financing for services require sound and transparent financial systems, reflected in the independently audited annual financial statements. The data on 234 municipalities' attributes (structure and capacity) were analysed to assess the extent to which the surveyed attributed contributed to FRAO achieved. The 234 municipalities excluded district municipalities as they did not shoulder service delivery-oriented powers and functions similar to those of local and metropolitan municipalities.

Only two municipal attributes were considered in this study. Historical municipal attributes influencing municipal FRAO were coded from the published listing of municipal capacity and structure categories. The data collected was based on a priori expectation regarding municipal attributes that could influence positive FRAO while implementing municipal efficacy reforms.

The proto-type logit model specified for this research was fitted under two situations. Firstly, maximum likelihood estimates were obtained with the two explanatory variables. Secondly, the model was fitted through a stepwise selection procedure to determine which of the two attributes mattered most. The explanatory variable (municipal attributes) investigated were as specified in Table 4. The expected direction of the relationship of the explanatory variables in the proto-type model with the criterion variable indicated in parenthesis.

Table 4: Explanatory and criterion variables and their coding

Criterion variable:	
FRAO	1 if the municipality obtain unqualified audit in 5 out of the 8 years surveyed and 0 otherwise. This emphasise consistency in achieved outcomes.
Explanatory variables	
Capacity	3 if the municipality was categorise as high capacity, 2 if the municipality was categorised as medium capacity, and 1 if the municipality was of low capacity category (+)
Structure	3 if the municipality is a metropolitan, 2 if the municipality is a district, and 1 if the municipality is local in terms of the Local government: Municipal Structures Act (Act No 117 of 1998) (+)

At the end of each audit, the audit opinion issued by AGSA is in any of the five categories: unqualified opinion without emphasis of matter, unqualified audit opinion with emphasis of matter, qualified audit, disclaimer due to limitation of scope, and adverse. For purposes of improving municipal financial performance, operation clean audit should focus on modified audit report, represented by the last three types of audit opinion. This study considers unqualified audit to be good performance.

8. Analytical framework

To investigate the chances of a municipality to achieve improved performance, as defined by FRAO, the logit model was used to estimate the relationship in which the probability to achieve and sustain improved FRAO (succeed) is considered to be a function of explanatory variables. The logit model is used in this study because ordinary least square model is inappropriate when response variable is dichotomous (Ameyiya, 1981; Hosmer and Lemeshow, 1989; Allison, 2012; Tobin, 1958; Maddala, 1991). The FRAO, our criterion variable, is discrete and therefore the analysis of data and determination of relationships is done in the context of a choice model. In this study, the criterion variable is viewed as the probability that a municipality is inclined to achieve and sustain improved financial performance given certain factors (municipal attributes). History of audit outcomes may be a factor. Success is defined as achieving unqualified audit opinion from AGSA in more than a half of the period 2005-2013.

The researcher explored other alternative specification of quantitative choice models and was guided by the findings of Maddala (1991). Quantitative choice models include linear probability, probit, and logit model. These three statistical choice models are available on

most computer-based statistical packages and can analyse binary response variables such adopt or not adopt newly introduced technology or financial reporting regime. Of the three choice models, logit and probit are preferred to linear probability model when quantitative modelling is based on a sample of data. In such cases, linear probability model suffers from a number of inadequacies. For instance, variance of error terms of the linear probability model is heteroscedastic and the standard errors of the parameter estimates are biased (Allison, 2012).

In addition, Hosmer and Lemeshow (2013) and Allison (2012) have noted that the error term does not follow a standard normal distribution. Therefore, classical statistical test of significance are inappropriate if certain null hypotheses has to be rejected or accepted. Thus Feder, *et al* (1982) and Maddala (1991) have recommended the use of probit and logit models as appropriate approaches to take care of heteroscedacity of the error term as well as confine predicted values of the criterion variables in the range on 0 and 1. Nayga and Capps (1992), and Maddala (1991) have demonstrated that neither logit nor probit has advantage over the other in the case of binary choice models.

The researcher's decision preference of logit over probit was based on convenience and supported by the findings of Pohlman and Leitner (2003). Pohlman and Leitner (2003) compared, on the basis on common data sets and assumptions, ordinary least squares (OLS) and logistic regression and findings showed logistic regression yielded more accurate predictions of dependent variable probabilities.

9.   Results of Analysis
9.1   Model fitting results based on two explanatory variables

After obtaining logistic regression model fitting results (Table 6a), the study proceeded to examine the issue with regards to the question "*How do we know if model fits the data?*" The Statistical Package for Social Scientists (SPSS) software used in analysing the data has approaches that we relied in examining this issue. Broadly, the approaches fall into two categories: measures of predictive power, for example, R-square and model classification results, and goodness of fit tests. Allison (2012) argues, after showing limitations of other approaches, for measures proposed by Tjur (2009). The study therefore generated most of goodness tests and performed targeted tests where the model may have failed to pass all of them.

Results showing parameter estimates and overall classification achieved by the logistic model are presented in Tables 6a and 7. The parameter estimates shown in the model fitting results (Table 6a) summarises the effects of each explanatory variable investigated. The wald statistic shown is equal to the ratio of the regression coefficient to the standard error, squared. The significance level of wald statistic is ≤0.05 although a true significance level slightly higher will not really affect conclusions drawn (Maddala, 1991:792). We therefore, conclude that the parameter estimates for capacity categorisation are useful in the model. However, the municipal structure is not significant given a computed significance value of 0.17. The

direction of expected relationship of the explanatory variables in the model fitting results with the FRAO is positive and consistent with our a *priori* expectation.

The quantity of exponential of the regression coefficient (β), shown under exponential (β), indicates a factor by which the odds changed when the relevant explanatory variable made a unitary change (Szumilas, 2010; and Allison, 2012). The regression coefficient constitute the estimated increase in the log odds ratio of FRAO per unit change in the explanatory variable. In this paper, the odds of a municipality obtaining unqualified audit opinion is referred to as the ratio of the probability that a municipality would have achieved unqualified audit report to the probability that a municipality would not have achieve unqualified audit report given the explanatory variable. For instance, when municipality capacity categorisation changes from low (1) to medium (2), the odds were increased by 1.57, with other factors remaining constant. In the case of structure categorisation, a change from local (1) to a district (2) would result into an increase of the odds by 1.94.

Table 6a: Model Fitting Results

Variable	Coefficient(β)	Std Error	Wald	df	Significance	Exponential(β)
Capacity	0.45	0.19	5.78	1	0.02	1.57
Structure	0.66	0.48	1.92	1	0.17	1.94
Constant	-2.03	0.56	13.29	1	0.00	0.13

Table 6b: 95% Confidence interval Results for Explanatory variables

	95% Confidence .Interval .for EXP(β)	
	Lower	Upper
Capacity	1.09	2.28
Structure	0.76	4.94

Because the 95 per cent confidence interval (Table 6b) of 1.09 to 2.28 is greater than 1, the increase in the odds of 1.94 of a municipality achieving unqualified audit report among SA metropolitan-structured municipalities is statistically significant. This could be attributed to leadership and resource base associated with such structures. The exponential (β) of 1.94 suggests that the regression coefficient for structure of 1.16 provides estimated increase in the odds of FRAO per unit change in the municipal structure category.

Table 7: Classification Results

Observed		Predicted		
		FRAO2		
		0	1	Percentage Correct
FRAO2	0	146	2	98.6
	1	80	6	7.0
Overall Percentage				65.0

With regards to the classification of predicted results on overall classification achieved by logistic regression model (Table 7) reveal that 146 (98.6 percent) municipalities with a poor FRAO were correctly predicted by the model to have failed to achieve unqualified audit report outcome. Similarly, 6 (representing 7 percent) municipalities with unqualified audit report were correctly predicted to have achieved unqualified audit report. In overall, 65 per cent of 234 municipalities (excluding districts municipalities) were correctly classified by the fitted logistic regression model.

The overall classification results and coefficient of determination (R^2) help measure how well the fitted model can predict the criterion variable based on the selected explanatory variables. However, the two do not tell us how well the model fits data used. Consequently, Table 8 presents Hosmer-Lemeshow (HL) test statistic for goodness-of-fit results. Goodness of fit results facilitated to determine whether the model fitting results adequately describes the data. The HL test statistic indicates a good fit because the significance level of 0.615 is > 0.05.

It was noted that the HL test statistic, although incorporated in most statistical packages, fails on reliability criterion each time sample size changes. Therefore, the conclusions drawn in this case were complemented by overall classification results (Table 7). Allison (2012) argues that the HL test presents serious problems associated with the number of groups created out of the sample data. The researchers, in this instance, failed to find any theory in statistical literature that justifies the use of presently set groups of 10 in the SPSS used to analyse the data.

Table 8: Hosmer-Lemeshow Goodness-of-fit Tests

Chi-square	Degrees of Freedom	Computed Significance
0.252	1	0.615

9.2 Stepwise variable selection results

Table 9a presents final results of forward STEPWISE logistic regression used to identify a statistically significant explanatory variable from the two used in this study. Recall that the critical issue in this study is whether the explanatory variable is deemed to be a significant

determinant of FRAO. For this purpose, levels of significance of 5 per cent and 10 per cent were used for explanatory variable inclusion and exclusion in the stepwise model fitting results, respectively. The 10% level of significance was used for variable inclusion to be consistent with observation elsewhere that a level of significance less 10% was too restrictive to allow inclusion of "important" variables (Hosmer and Lemeshow, 2013). The results show that municipal capacity to be significant at 0.004 significance level. The municipal structure categorisation could only be included in the model fitting results (stepwise) if the removal level of significance had be set at 15 per cent.

Table 9a: Parameter estimates for stepwise logistic regression procedure

Variable	Coefficient(β)	Std. Error.	Wald	df	Significance.	Exp(β)
Capacity	0.525	0.183	8.260	1	0.004	1.691
Constant	-1.452	0.350	17.199	1	0.000	0.234

Model classification results present in Table 9c showed that 128 (representing 86 per cent) municipalities with poor audit report were correctly predicted by the model not to have achieved unqualified audit. Likewise, 21 municipalities with unqualified audit opinion report were correctly predicted to have attained unqualified audit opinion. The overall correct classification declined by 1.3 per cent as a result of excluding municipal structure categorisation variable through a stepwise procedure. Only 86.5 percent, down from 98.6 percent, of municipalities with modified audit reports were correctly classified to have received modified audit reports.

Table 9b: Classification Results Based on Stepwise Model

		Predicted		
		FRAO2		
Observed		0	1	Percentage Correct
FRAO	0	128	20	86.5
	1	65	21	24.4
Overall Percentage				63.7

The overall significance level of the one-factor logit model using HL test statics showed that the model to be significant given the computed significance value of 0.615 (Table 10), which is greater than 0.05.

Table 9c: 95% Confidence Interval Test

		95% C.I.for EXP(B)	
		Lower	Upper
Step 1[a]	Capacity	1.182	2.418
	Constant		

The 95% confidence interval (Table 9c) was used to estimate the precision of the odds ratio. The 95% confidence interval was used as a proxy for the presence of statistical significance if does not overlap the odds ratio =1 (the presence of capacity does not affect the FRAO. The presence of municipal capacity categorisation in the stepwise model fitting results in higher odds that the municipal structure categorisation.

Table 10: Hosmer-Lemeshow Goodness-of-fit Tests

Chi-square	Degree of Freedom (df)	Computed Significance
0.252	1	0.653

10.   Discussion of Results

Explanatory variables' contributions to the FRAO are indicated by the logistic regression coefficients and associated signs. The interpretation given to statistics calculated using data on municipal capacity and structure categorisation should be understood in the context of the coding system used. High, medium and low capacity were coded at 3, 2, and 1, respectively, while municipal structure categorisation was code at 3, 2, and 1 in respect of metropolitan, district, and local municipalities.

In light of statistically significant and sign of regression coefficients (two-factor model), the results indicated that municipalities with high capacity and falling with metropolitan municipal structure have high chances of achieving unqualified FRAO. Municipalities falling within the local municipality structure and having low capacity were more likely to struggle to achieve and sustain unqualified FRAO. This finding is consistent with the a priori expectations referred to in the section 8 of this paper.

Stepwise logistic regression results show that municipalities with high capacity are more likely to achieve unqualified FRAO. The municipal structure categorisation factor was excluded in the model that resulted into an overall correct classification of 63.7 per cent, representing a marginal drop (1.3%) in the overall classification results of the two-factor model. This demonstrated that the aspects in Table 3, which the NT used to make capacity categories (high, medium and low) were indeed relevant in ensuring sustainable positive FRAO. This finding is consistent with the findings by Ireland (2003) providing evidence of association between observable firm characteristics and audit reports in the United Kingdom.

Because the model fitting results do not provide more than 75% correct classification, the study concludes that there are other factors (other than capacity) that matter in the sustained FRAO. In addition, the back-to-basics programme's three performance tracks (high, medium, and low) could benefit from survey of variables similar to those addressed by the 2004 NT-led capacity survey.

11.   Conclusions, recommendations, and implications

The primary objective of this study has been to developing and testing a composite model, based on selected municipal attributes, to predict municipal FRAO. The study sought to provide answers to research question in section 3 and provide insights into conclusions provided in previous studies using firms external to the municipal environment. The study used data on 234 municipalities, after excluding district municipalities. A multivariate statistical technique, a logistic regression analysis was employed to develop the model using historical municipal audit outcomes. The two explanatory variables used does not provides 98.6 percent correct classification of municipalities that have consistently received modified audit reports. The selection of the two explanatory variables is not entirely influenced by previous studies on predicting modified audit reports among private sector firms but was guided by the reform efforts undertaken by government to improve municipal financial management, accounting, and reporting.

This paper found a combination of municipal structure and capacity categorisation to contribute to the FRAO. However, stepwise logistic regression results reveal that municipal structure categorisation is not a significant factor if municipal capacity categorisation is present. The model fitting results provides an overall correct classification of not more than 63.7 per cent. The correct classification of municipalities with a history of modified audit reports reduced from 98.5 percent (full model fitting results) to 86.5 percent (stepwise model fitting results). We conclude that there are other factors that can be used to improve the overall correct classification of the model from 63.5 and predict audit outcomes. These other factors shall form the basis of investigation in developing and testing a composite model to predict audit outcomes.

The focus on the municipal audit outcomes is important at this stage as the AGSA reports have been used in the past to guide operational clean audit. In addition, public sector auditing practice and decisions are systematically based on financial accounting information. Therefore, the national government can use the composite model to identify municipalities likely to have modified audit reports on a consistent basis and design intervention procedures accordingly.

The employed methodological framework could assist auditors, national government, researchers, and credit scoring agencies. The present study contributes to accounting and auditing research by examining municipal specific attributes that could discriminate audit outcomes and redirect remedial efforts to municipalities predicted to receive modified audit reports.

Because of the significance of municipal capacity categorisation in the model fitting results, we conclude, statistically, that capacity categorisation undertaken by the NT has a predictive value in guiding adoption of municipal efficacy reforms envisaged when MFMA was promulgated. A further possibility would be to examine variables such as compliance index, governance variables, and financial performance index. This paper focused on explaining and predicting FRAO to the exclusion of audit of performance information (AOPI), introduced in

2009. It will be important for further research to consider AOPI, alongside effectiveness of integrated reporting among SA municipalities and documented good practice indicators (Text Box 1).

In light of the concluding remarks, for start, it will be advisable for municipalities to manage aspects affecting financial governance, formulation of financial management improvement plans, audit action plan for managing external audit process, and activities within budget preparation, execution and reporting cycle. These are aspects that guided municipal capacity categorisation and were not specifically disaggregated and considered in the model development.

References

Accounting Standards Boards (ASB) 2012. Presentation of financial statements, ***Standard of Generally Recognised Accounting Practice No. 1***, Pretoria: Accounting Standards Board.

Ahlenius, IB. 2000. Performance audits, evaluations and supreme audit institutions, ***International Journal of Government Auditing,*** 27(1):1-2

Aldrich, JH. and Nelson, FD. 1984. ***Linear Probability, Logit and Probit Models.*** Beverley Hills: Sage University Publications, Inc.

Allison, PD. 2012. ***Logistic Regression Using SAS: Theory and Application***, Second Edition, Cary, NC: SAS Institute

Allison, P.D. 2013. Why I do not Trust the Hosmer-Lemeshow Test for Logistic Regression, *http://www.stasticalhorizons.com/hosmer-lemeshow* (accessed on December 10, 2014).

Ambe, IM. & Magiro, SO. 2008. Evaluation of the implementation of public sector supply chain management and challenges: A case study of the Central District Municipality, North West Province, South Africa, ***African Journal of Business Management***, 2(12): 230-242

Amemiya, T. 1981. Quantitative Response Models: A Survey. ***Journal of Economics Literature***, 19(4): 183-1536.

AGSA. 2014. ***Consolidated general report on the audit outcomes of Local Government,*** Pretoria: Auditor General South Africa.

Caramanis, C. & Spathis, C. 2006. Auditee and audit form characteristics as determinants of audit qualifications, ***Managerial Auditing Journal***, 21(9): 905-920.

Chalmers, AF. (1999). ***What is This Thing called science?*** Maiden: Open University.

Christiaens, J. 1999. Financial accounting reform in Flemish municipalities: an empirical investigation, ***Financial Accountability & Management***, 15(1):21-40.

CoGTA (2014). ***Local government: Serving our communities better!,*** Pretoria: Department of Cooperative Governance and Traditional Affairs. Available at http://www.cogta.gov.za/summit2014/wp-content/uploads/2014/10/plgsummit-backtobasics-discussion-document.pdf

Dopuch, N.R.W.,Holthausen, R.W.& Leftwich, R.W. 1987. Predicting audit qualifications with financial and market variables, ***The Accounting Review***, 62(3): 431-454.

Falkman, P. & Tagesson, T. 2008. Accrual accounting does not necessarily mean accrual accounting: Factors that counteract compliance with accounting standards in Swedish municipal accounting, ***Scandinavian Journal of Management***, 24(3): 271–283.
Feder, G., Just, R.E., & Zilberman, D. 1985. Adoption of Agricultural Innovation in Developing Countries: A survey. ***Economic Development and Cultural Change***, 33(2): 225-298.

Gong, T. 2009. Audit for accountability in China: An incomplete mission, ***Australian Journal of Public Administration,*** 68(S1), S5-S16.

Guba, E.G. and Lincoln, Y.S. 1994. "Competing Paradigms in Qualitative Research", in Denzin, N.K. and Lincoln, Y.S (Eds), ***Handbook of Qualitative Research,*** Thousand Oaks, CA:Sage Publications.

Green, W. 1995. Assessing issues relating to going concern audit qualifications and corporate failure, ***Australian Accounting Review***, 5(10):26-34.

Healy, M. & Perry, C. 2000. Comprehensive Criteria to Judge Validity and Reliability of Qualitative Research Within Realism Paradigm, ***Qualitative Market Research: An International Journal***, 3(3):118-126

Hood, C. 2007. Public Service by Numbers: Why does it vary? Where Has it Come From? What are the Gaps and Puzzles? ***Public Money and Management,*** 27(2):95-102.

Hosmer, DW. and Lemeshow, S. 1980. A goodness-of-fit test for multiple logistic regression model, ***Communications in Statistics***, A10:1043-1069.

Hosmer D.W. and S. Lemeshow (2013) ***Applied Logistic Regression*** (eds). New York: Wiley.

Ireland, JC. 2003. An empirical investigation of determinants of audit reports in the United Kingdom, ***Journal of Business Finance***, 30(7-8): 975-1016.

Johnson, LE. 1998. Further evidence on the determinants of local government audit delay, ***Journal of Public, Budgeting, Accounting and Financial Management,*** 10(3):375-397.

Kennedy, DB. & Shaw, WH. 1991. Evaluating financial distress resolution using prior audit opinions, ***Contemporary Accounting Research***, 8(1): 97-114.

Kinney, AS. and Ruggini, J. 2008. Measuring for Purpose: trends in Public Sector Performance Measurement and Management Practices, ***Government Finance Review***, 24(4): 14-23.

Kuenkaikaew, S. & Varsahelyi, S. 2013. The predictive audit framework, ***International Journal of Digital Accounting Research***, 13: 37-71.

Maddala, G.S. 1991. A perspective on the use of the limited-dependent variable and qualitative research, ***The Accounting Review***, 66(4): 788-807.

McClelland, AJ, & Giroux, G. 2000. An empirical analysis of auditor timing by large municipalities, ***Journal of Accounting and Public Policy,*** 19(1): 263-282.

Miah, N. 1991. Attempts at developing a conceptual framework for public sector accounting in New Zealand, ***Financial Accountability and Management***, 7(2): 83-97

Ngoepe, M. & Ngulube, P. 2014. The need for records management in auditing process in the public sector in South Africa, ***African Journal of Library, Archives & Information Sciences,*** 24(2): 135-150

Payne, JL. & Jensen, KL. 2002. An examination of municipal delay, ***Journal of Accounting and Public Policy***, 21(1): 1-29

Patton, J.M.1992. Accountability and governmental financial reporting", ***Financial Accountability and Management***, 8(3):165-180.

Pohlman, JT. & Leitner, DW. 2003. A comparison of ordinary least squares and logistic regression, ***Ohio Journal of Science,*** 103(5):118-125.

Powell, DM., O'Donovan, M., Ayele, Z., & Chogwata, T. 2014. ***Municipal audit consistency barometer: A consistency measure of resilience in local government,*** Cape Town: Multi-level Government Initiative. Available at: www.mlgi.org.za (accessed on May 23, 2015).

Powell, DM. & O'Donovan, M. 2014. ***Municipal audit consistency barometer (MAC-B2-2014 update): Audit consistency as a measure of resilience in the local government***, Cape Town: Multi-level Government Initiative. Available at www.mlgi.org.za (accessed on May 25, 2015)

Ryan, C., Robinson, M., & Grigg, T. 2002. Financial performance indicators for the Australian local government, ***Accounting, Accountability and Performance***, 6(2): 89-106

Schelker, M. & Eichenberger, R. 2008. Rethinking Public Auditing Institutions: Empirical Evidence from Swiss Municipalities, ***Available at SSRN 1028927.***

Sholtz, Y. & Lepheana, N. 2013. Implementing the MFMA regulations on minimum competency requirements for finance officials:The case of the City of Cape Town, ***IMFO: Official Journal of the Institute of Municipal Finance Officers,*** **13(3): 10-12.**

Szumilas, M. 2010. Explaining Odds Ratios. ***Journal of Canadian Association of Child and Adolescent Psychiatry***, 19(3): 227-229.

Tagesson, T. & Eriksson, O. 2011. What do auditors do? Obviously they do not scrutinise the accounting and reporting, ***Financial Accountability and Management,*** 27(3): 272-285.

Tjur, T. 2009. Coefficients of determination in logistic regression models—a new proposal: The coefficient of discrimination. ***The American Statistician***, 63: 366-372.

Tobin, J. 1958. Estimation of Relationship with Limited Dependent Variable. ***Econometrica***, 22(1): 24-36.